HEALTH EDUCATION MONOGRAPHS

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RESEARCH RELATING TO HEALTH EDUCATION

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GAPS AND POTENTIALS IN HEALTH EDUCATION RESEARCH

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1950
SOCIETY OF PUBLIC HEALTH EDUCATORS

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HEALTH EDUCATION — ITS OBJECTIVES AND METHODS

MAYHEW DERRYBERRY, Ph.D.*

In the documentation for the 12th World Health Assembly, it is stated that: "Health education embraces the sum of *all* those experiences of an individual that change or influence his attitudes or behavior with respect to health and the processes and efforts of bringing these changes about."

This concept of health education recognizes that "*many* experiences of an individual have an impact on what he thinks, feels and does about health"(1) . . . that it is "more than mere information or propaganda."(2)

The particular significance of this concept for us is the emphasis placed on the individuals, groups, and communities toward whom the health education effort is directed. In other words, the primary concern is the degree to which health education is successful in helping the particular individuals or groups to acquire more information about health, to change and improve their health practices. The methods and materials used to achieve the desired results are a secondary consideration.

In this sense, public health education is similar to what happens in our schools today. As parents, or others responsible for the younger generation, we are vitally interested in what our children learn. Our concern with the teachers, their methods, or the materials they use is important only as they contribute to the educational growth of our children.

Or let us use another analogy, that of selling merchandise. A merchant is concerned with the volume of sales when he talks about salesmanship. To be sure he observes carefully how his advertisements in newspapers and magazines look and where they are placed on the page. Similarly, he listens and watches to hear and see his radio and television commercials. But his real concern with this phase of merchandising is that it produces an increase in the sales of his product.

And so it is with health education. Inches of news coverage, number of television programs, volume of printed materials distributed, and the like, are secondary considerations to the question of *what changes have been brought about in the target audience.*

What then are some of the educational processes that go into bringing about increased health knowledge and improved health attitudes and practices? To me, the processes are almost completely analagous to those used by physicians in the practice of medicine. Let us examine more closely the similarities shown in graphic form on Chart I.

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Chart I

THE PHYSICIAN	THE HEALTH EDUCATION WORKER
The Underlying Sciences	
Physiology Biology Anatomy Chemistry Physics To a lesser extent, behavioral science	Behavioral Sciences: Psychology Sociology Anthropology To a lesser extent, natural science
The Problem	
Symptoms, such as: Headaches Temperature Low back pain Dizziness	Symptoms, such as: Many children not immunized against polio; high mortality from coronary disease; failure to use cervical test for cancer; few people having periodic medical examination
Possible Action	
Shotgun prescription	Intensive information program
Diagnosis Based on:	
History Blood tests: Pulse Sugar & cell count, etc. Blood pressure Urinalysis X-Ray	A person's or a group's: History of past experiences Information or knowledge Culture and traditions Personal goals Perception of health practices, etc.
Treatment	
What shall it be? Who shall give it?	What shall it be? Who shall give it?
Pharmacopeia	
Drugs Radiation Therapy Rest Physical Therapy Diet	Community organization; Films; Group discussions; Individual instruction; Lectures; News Releases; Pamphlets; TV
Follow-Up	
Periodic Observation of: Symptoms and progress	Periodic Observation of: Progress in change of — Attitudes Behavior

Those who practice medicine apply research findings from the basic biological and physiological sciences and to a lesser degree utilize the behavioral sciences. Those who attempt to improve people's health practices — those engaged in health education — apply research findings from the basic behavioral sciences — psychology, anthropology, and sociology — in their interpreting and stimulating practical use of the natural sciences.

The steps that these two groups of practitioners go through in applying their respective sciences are almost identical.

The physician generally begins with one or more symptoms of disorder which the patient reports or which the physician extracts from him. The health education worker usually starts with "symptoms" also: Evidence that an individual, a group or a population are not practicing the findings of science which, if followed, would improve their health.

At this point, each can follow a similar course of action. The physician can treat the symptoms . . . by giving the patient a "shotgun prescription." The health education worker can shower the people with information on the assumption that they are ignorant of the research which dictates certain desirable health practices. In certain limited and emergency situations this use of the shotgun type of action can be highly effective. However, these situations are relatively rare.

But in most situations, the physician will avoid, if at all possible, symptomatic treatment. He will proceed to make a diagnosis. *Why* does the patient have headaches, dizziness, a fever, or low back pain? For this diagnosis he not only takes a history, but he may give the patient a number of tests. He may call in various technical experts, internists, radiologists, pathologists, etc. to the extent he considers it necessary to make a reasonably accurate diagnosis. Here he weighs complete accuracy and assurance against the time required, the expense involved and other relevant considerations.

The skilled health educator, too, works on a diagnosis, an *educational* diagnosis. Is the failure of the people to follow sound health practices due to lack of information, or are they more interested in something else? Is some past experience with health services deterring the people from good health practices? Does the recommended health practice interfere with the achievement of some other goal they have? Do they see the practice of the health habit as lowering their status or bringing disapproval from members of their social group?

These are the types of questions to which the skilled health education worker needs answers in order to diagnose the cause of the poor health practices he has observed. In obtaining satisfactory answers, the health education worker may also call in experts — behavioral scientists — to assist in arriving at the educational diagnosis.

Just as the physician uses or adopts diagnostic tools from the sciences of which he is a practitioner, so the health education worker draws his diagnostic tools from the behavioral sciences. Admittedly, the tools of the health education worker have not yet been developed to the same degree of precision as those of the physician. Furthermore, they generally require more time to use, and in most cases, are more expensive to apply. Despite these drawbacks, using such measurements is far better than guessing at the diagnosis. And time is on the side of the health educator since it

is seldom necessary that he reach his diagnosis in the same short period that is required in the case of a medical emergency.

Once the diagnosis has been made, the physician then prescribes a course of treatment and indicates who will give it. Sometimes he himself may be the principal person, as in surgery. Sometimes it is the nurse, physiotherapist, or members of the patient's family.

He may also prescribe certain medicines and procedures from his pharmacopeia as aids in the treatment.

Similarly, the health educator prescribes the educational treatment after he has reached his diagnosis. He, too, decides who should administer the treatment. It may be the doctor or the nurse, the priest, the family, or he himself may be the principal person to carry it out. The health educator also draws upon his pharmacopeia of educational aids and methods — community organization, exhibits, films, group discussions, individual instruction, lectures, news releases, pamphlets, posters, television programs, etc.

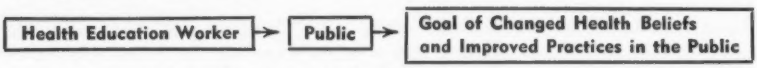
The doctor constantly watches his patient. He notes how he is responding to treatment, and on the basis of his observations, refines his diagnosis and revises his treatment to make them more effective. He may, and usually does, accumulate evidence to evaluate his handling of the immediate and related future cases.

The health educator also keeps checking the accuracy of his educational diagnosis and the efficacy of his prescribed treatment. During the course of it, he may suggest different people to carry out parts of the treatment or he may completely change the type of aids he has prescribed.

Finally, the health educator continuously evaluates his efforts in order to become more proficient in diagnosis, in prescribing educational experiences, and in improving the quality and effectiveness of his aids.

Our analogy to medicine is one way of viewing the processes involved in increasing people's health information, changing their health beliefs and improving their practices. But there are other ways to look at this and we in health education recognize the value of presenting the same concepts in a number of frameworks.

Let us look at the same phenomena from the physics analogy of lines of force. If I may repeat, the health education worker is concerned with changing the public's beliefs and practices about health and uses his efforts to bring about these changes. In its simplest form, this effort can be represented like this:



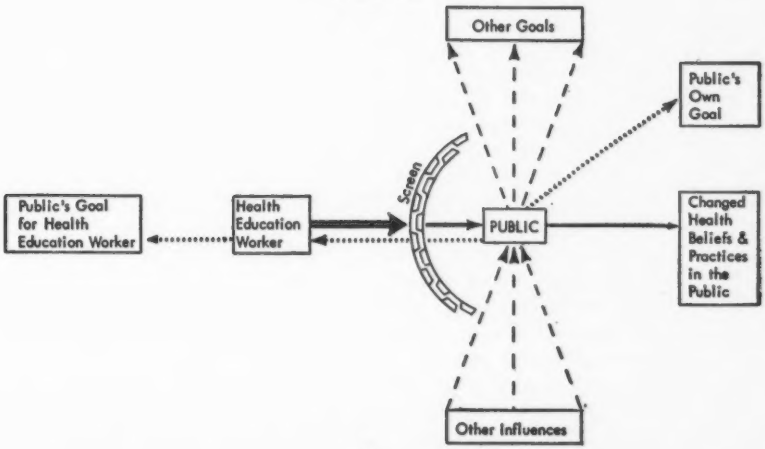
The line of force between the health education worker and the public may be health education materials and methods of any kind — personal conference, community organization, news releases, magazine articles, movies, radio, television, exhibits, pamphlets and the like. In this simple

physics representation, it would appear that the line, or lines, of force exerted by the health worker impinge upon the public without any interference and the stronger the force, the greater the impact on the public – pushing them towards the goal of changed beliefs and improved health practices. Furthermore, this visual representation treats the public as an inert mass with no internal forces that influence its movement.

Certainly none of us subscribes to this simplified statement of changing health behavior, but is it fair to ask whether this visual representation does not closely correspond to the way we often carry on health education programs?

We still have the basic pattern – the health education worker is exercising force on the public to push it toward changed health beliefs and improved practices (in Chart II represented by a solid line). But instead of the line of force reaching the public unimpeded, we find a screen through which the lines of force must penetrate if they are to have any impact. This screen is made up of such factors as: Interests of the public, their motivations, their perception of our interests and concerns, their past experiences (particularly with following previous health advice) and a host of other influences which the health education worker needs to understand before he can find the ways for his line of force to penetrate this screen. Even so, the intensity of the line of force may be diminished as it finds its way through the screen. But the screen is not the only factor. There are other external influences exerting lines of force to push the public in other directions toward other goals. (In the diagram, these are shown as broken lines.)

Chart II



There are also *internal* forces operating from *within* the public, such as particular goals they may have set, shown by dotted lines in the chart. It could be that the public is trying to exert force on *us* — to push us toward a goal they have in mind for us. (This force is represented by dotted lines.)

Let us look at a real problem in this framework. Some health education workers are concerned with the mounting death toll from lung cancer. On the basis of the evidence, they are exerting educational force on those who are smoking cigarettes to stop smoking or at least reduce the amount they smoke. The impact of the force of their educational effort on the smokers (the public in our chart) is diminished by lack of interest, the belief that lung cancer "can't happen to me," the fatalistic attitude of "I've got to die of something, so why not lung cancer," and other rationalizations that go into the smoker's screen. The tobacco companies, social pressures, and other cultural patterns encourage smoking. (Other influences.) Sometimes I get the feeling that the smoker's goal for me (when I undertake to be a health education worker on this subject) is to shut me up! Despite this inadequate and incomplete analysis of the educational problem involved in cigarette smoking and lung cancer, I am sure all will agree that this analogy and analysis more nearly approaches reality than the simple exercise of force pushing to a predetermined goal.

In developing these two ways of looking at health education, I have had four main purposes in mind:

1. *To draw attention to the many facets to be considered in improving the health practices of the public.* Frequently, the diagnostic phase — to determine the barriers or screen, the other external lines of force and the internal forces which may be impeding the efforts of the health educator — is completely overlooked. In other instances, there is failure to "prescribe" the person who will be the most effective teacher for the particular task. All too often health education is discussed only in terms of its pharmacopeia — i.e., its methods and materials.
2. *To emphasize some of the complexities encountered in effecting health behavior change.* I submit that trying to diagnose *why* people do not follow desirable health practices and then to develop a treatment pattern to bring about improvement is as difficult (and perhaps more so) for the health educator as it is for the physician to diagnose and prescribe successful treatment for brain tumor or low back pain!
3. *To indicate how important it is that our health education practitioners have a thorough understanding of the behavioral sciences.* The developments in these fields during the last two

decades have been tremendous; so much so that many of the scientists themselves have difficulty in keeping up to date.

4. *To provide a framework to which we may relate the presentations on research in health education by Dr. Hochbaum and Dr. Rosenstock.*

Summary

Health education is concerned with effecting improved health attitudes and behavior in the general public. Accomplishment of this goal requires careful and thorough consideration of the present knowledge, attitudes, goals, perceptions, social status, power structure, cultural traditions and other aspects of whatever public is to be reached. Only in terms of these elements can a successful program be built.

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RESEARCH RELATING TO HEALTH EDUCATION

GODFREY M. HOCHBAUM, Ph.D.*

As Dr. Derryberry has shown, effective health education encompasses a diagnostic and a treatment phase coupled with thorough and objective evaluation. It is possible to examine research relating to health education roughly parallel to the same categories.

First, one can think of studies underlying the diagnostic phase of education: these attempt to identify factors which determine what people will do or will not do and to identify the conditions that will make people likely to listen to, accept, and profit from educational activities; second, there are studies underlying the treatment phase: these deal with methods and techniques by which effective education may be provided; and finally, a third type of study has as its aim the development of specific methods and techniques which will permit us to strengthen health education programs through recognizing strong and weak aspects.

We will not attempt to examine research carried out in all of these areas. In fact, if one looks at just one of these – research on factors which determine what people listen to, what they accept, what will influence their behavior – one is overwhelmed with the enormous amount of work that has been done at universities, in industries and in government, at non-profit and commercial research institutes and elsewhere. Such research has been carried out by psychologists, sociologists, and by a variety of members of other more or less formally defined disciplines. It has been reported in books, articles, administrative reports, speeches, and unpublished master's and doctoral dissertations. To attempt even a cursory review would be a Gargantuan task. Indeed, even if we restricted ourselves to selecting highlights of the most significant research, we would have to exceed the limits of the present publication.

In this dilemma we shall follow a path that may whet the researcher's appetite without satisfying it. In short, we shall try merely to point to selected research areas and findings that are pertinent to health education. And we shall have to ask the researcher's indulgence if this should prove to be more frustrating than satisfying in the long run.

Communication Research

Let us take as our point of departure an educational program attempting to influence people in a community to take given health actions such as obtaining polio vaccination, seeking X-rays, or brushing teeth after every meal. Obviously, a basic step in this program would be to inform

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the population in the community of the value that such action would have for them and of the means by which they can carry it out. Furthermore, we somehow would have to influence them to follow up what they have learned with the action itself. At first glance, this appears to be a relatively uncomplicated matter. Seemingly we would merely need to use those media of communication that are likely to reach the greatest number of people, that is, the mass media of communication: radio, TV, newspapers, magazines, mail pamphlets, posters, exhibits, and what have you. In this, we have available the results of intensive work done especially in market and advertising research which has yielded a large array of techniques and instrumentation to maximize the impact of these media.

The trouble is that merely bombarding the public with health information, no matter how valuable and useful, in no way assures that the public learns from it or even hears or sees such communications. Research on the relationship between perception and motivation has demonstrated that people do not always see what is shown to them or hear what is told them; that they, under certain conditions, readily forget or distort what they have just seen or heard; and that even if they have apparently learned the content of such communication – that is, when they are truly and correctly informed about the facts – they do not necessarily take the appropriate action suggested by the communications. Let us see why this is so.

The principal disciplines active in this area, psychology, sociology, and anthropology, may look at human behavior from different points of view and they may have developed slightly different theories to account for the ways in which certain aspects of human behavior emerge and develop, but they agree on certain basic facts. All human behavior – even the slightest, apparently simplest act – is determined by a variety of factors. Among them are some which may be considered as residing or being active within the person. These have been called by various names: needs, motives, fears, goals, desires, and others. Others are forces acting on the person from without, principally the cultural and social influences which play an important role in creating some of these inner forces. They also serve both to stimulate and to inhibit the free functioning of the inner forces and, in turn, are influenced by them.

From communication research we have learned the basic truth that people tend to see and hear (that is, perceive) those things in their environment that fit into what they already believe and what is congruent with their habits, standards, and customs.(7, 10, 11, 13, 24) This even applies to such simple things as reading advertisements in newspapers and magazines. It has been found, for example, that people who have just bought a new car tend to read ads and write-ups praising the car they have purchased, often more than they had prior to the purchase.(3) It seems that they read these messages to reassure themselves that they

have done the right and intelligent thing. Similarly it has been found that people tend to listen to speeches and statements made by political candidates for whom they have already decided to vote; in this process, they avoid exposing themselves to communications that might make them feel uncertain about the decision they have already made.

The implication of this finding for health education is a disturbing one in view of the fact that our most important educational efforts are likely to be addressed to those people who exhibit opinions and behavior contrary to what is deemed desirable from a medical point of view. If we simply use mass media to transmit correct information to the public, we are likely to reach those who already have fairly accurate information and who already agree with what we want them to do; but we may fail to be seen or heard by (that is, we may fail to communicate to) our most eagerly sought population targets. Thus, it appears that regular medical columns in newspapers have a fairly faithful audience — that is, the same people tend to read them regularly.(16) These people, however, are those who are already interested in health while those who are not do not seem to be attracted to such columns.

Normally we require that our audience not only read or hear health educational materials but also remember and believe them. To an even greater extent than is the case with mere perception of educational material, communications are believed and correctly remembered largely to the extent to which they fit into people's present beliefs and habit systems. There is abundant evidence that the constellation of these already existing beliefs, established health habits, and customary ways strongly predispose people to accept or reject new information. It becomes extremely important, therefore, to insure that any communication be carefully calculated to take account of the kinds of beliefs, customs, and habits that are prevalent in the intended audience.

Attitude Research

I would like to illustrate the effect of such predisposition from two kinds of studies. In one study on attitudes toward the much publicized relationship between smoking and cancer(2), it was found that more than twice as many of the non-smokers than of the smokers accepted this relationship. Even more interesting is the following: among non-smokers, the higher the educational level, the more likely the person is to accept the relationship. This is not surprising since education is highly correlated with the level of intellectual interests and with exposure to various media of communication.

However, among smokers, the study results showed the reverse: the higher the educational level, the less likely a person is to believe the relationship between smoking and lung cancer. A possible interpretation might be this: there is forced upon the smoker a piece of informa-

tion that is contrary to his deeply ingrained habit. In order to resolve the conflict between this new piece of information and the powerful habit, the weaker of the two has to yield. If he finds his habit so strong that it is too difficult to throw it off, he rejects the information by rationalizing it away, perhaps by emphasizing the circumstantial nature of the evidence. Education and its concomitants, intelligence and information, help him accomplish this rationalization in an efficient manner. We see, then, that the non-smoker who has no emotional feeling in the matter is able to use his intellectual resources to benefit from such information, while the smoker with his deep and powerful involvement in the habit uses the same intellectual resources to reject such threatening communications in an efficient and thorough manner. It should be emphasized that this interpretation of the findings is purely hypothetical. In fact, the same intricate relationships reported in 1956 may no longer hold true since accumulating evidence has made it increasingly difficult for the educated, and intelligent, person to rationalize it away.

Research on Effect of Fear

The other illustration comes from the work done on the effects of anxiety and fear on perception and behavior. We all know that fear and anxiety play a very crucial part in the area of health and disease. We are also aware of the motivational power of fear. Therefore, the temptation to use fear appeals has been great when the purpose has been to influence people to take certain preventive health action. As a matter of fact, anxiety has been aroused frequently in the course of public health programs, sometimes deliberately, sometimes inadvertently. However, what is easily forgotten is a very important finding by psychologists working in this area, that anxiety itself may be more disturbing and more painful than the thing that aroused it in the first place. Hence, people will go to great length to rid themselves of the intense discomfort engendered by anxiety and will avoid anything that might be likely to produce or increase it.(7, 14)

It follows from the findings of such research that if a person's anxiety is aroused at the same time as he is given means by which he can eliminate its cause, he is likely to take constructive action. For example, Rosenstock describes the following episode in his report on an investigation carried out by him a few years ago during a catastrophic flood in Winsted, Connecticut.(29) The local health officer in the flooded town offered all citizens the opportunity to receive typhoid immunization. Even though he may have aroused fear in the population by his efforts to communicate the existence of a serious health threat, at the same time he offered the people the opportunity to protect themselves against the threat through obtaining immunization. As a consequence, nearly 100 per cent of the population availed themselves of the opportunity. If, on the other hand, fear is aroused in people concerning some threat against which they see

no means of protection, the results may be very contrary to the intended ones. A good case in point is the present widespread cancer phobia. As this phobic fear increases in intensity and as long as people do not believe that anything can be done to protect them against the disease, they are put into a position where they have to suffer intense fear without being able to do anything about it. The fear itself being so intensely painful, these people may develop psychological means for diminishing this pain. As demonstrated in various research on this matter, a common means which people find to accomplish this is the avoidance of any communication that is likely to maintain or further increase the fear — that is, people very strongly afraid of cancer tend to avoid reading any more health educational material about cancer.

The examples given so far illustrate a very few of the findings from behavioral science research dealing with conditions under which people will perceive and learn from educational material made available to them. Although only sporadic studies on this matter have been carried out in the area of health, such research has contributed to our understanding of the whys of human behavior relating to the maintenance of one's health. Of course, these few examples do not do justice to the wealth of knowledge that is available.

Research on Social and Cultural Factors

The reader may have become aware of the fact that all the findings mentioned so far refer to things that take place within the individual: his interests, motives, needs, fears, and his predisposition to benefit from or to reject educational material. To know about these things and to understand the way they function and interact can be of great help to those, such as the practicing physician, the dentist, the nurse, or the sanitarian, whose educational efforts are directed primarily at individuals.

However, public health programs more often than not are directed at broad population groups, whole communities, or still larger segments of the population. One may well ask how research findings such as those described could be pertinent to such programs. The attempt to answer this question leads to a consideration of research which has dealt with cultural and social forces. Much of this research has investigated the phenomenon that many of these private and individual needs, motives, beliefs, attitudes, and behavior patterns are really shared by larger groups of people. We know, of course, that all the people subsumed under the broad term of American culture have certain values, motives, and norms in common which members of other cultures do not share to the same extent. But within our own country there are also a number of subcultures. Long and painstaking research programs have led to the identification of some of those beliefs, customs, values, and behavior patterns which are typical of such groups, or subcultures, as southern Negro, New

England French, New York Puerto Ricans – not to forget such subcultures as represented by the middle class American or by members of the lower socio-economic levels. Hollingshead and Redlich(9) demonstrated that the health professions, being basically anchored in the American middle class, represent a different culture from the lower socio-economic classes with whose welfare they are frequently concerned. These two subcultures differ in many ways. In many respects, they speak a different language. They differ in what is important to them. They differ in the way they look at many aspects of life and health. They frequently simply do not understand one another. As a consequence, efforts on the part of health professions to work with members of the lower socio-economic levels tend to be frustrated by the inability of both parties to establish effective communication with one another, to understand one another, and to accomplish the common objective of improving the health conditions of the one group through cooperation with the efforts of the other.

Similarly, when reading studies on various minority groups in the United States, one cannot fail to be impressed with the degree to which each of them possesses common needs and common values which set them apart from other minority groups as well as from the so-called majority. One can easily overlook the fact that these differences go much deeper than differences in language, income, or education. This has important implications for approaches and methods that must be selected by members of the majority to establish the kinds of relationships that are likely to be conducive to educational success. Studies of such minority populations lead us to understand that the groups which we like to call "hard to reach" are hard to reach primarily because we try to approach them through channels of communication which are effective in our own social group but not in theirs, because we appeal to values which are ours but not theirs, and because we would like them to strive for things which are simply not important or perhaps even understandable to them.

To give one simple example, it appears that in the culture probably represented by the author and readers of these pages (that is, the middle and upper social classes), anticipation of and preparation for future contingencies are important and highly valued. We prepare for old age; we plan for the education of our children; we take steps, at least to some extent, to protect ourselves against future crises in the health area as well as in other areas. In the lower socio-economic levels and in many subcultures in this country, these values exist to a much smaller extent and frequently seem to be completely absent. In these groups, the satisfaction of immediate needs and desires becomes the overwhelming motive. Thus, if we wish to influence members of such groups to take preventive health action through appeals to the anticipation and preparation for future contingencies, we may well fail because this appeal has no meaning to them. Instead, we would have to make sure that we use appeals to values which are typical for such groups.

Up to this point, the emphasis has been on some of the factors and conditions which underlie what people learn and believe and which together with other forces determine what they will do. In a way, this relates to Derryberry's first phase, that of diagnosis, because in the course of planning a strategy for a public health program, it would be most desirable and necessary to diagnose carefully the kinds of needs, motives, perceptions, attitudes, customs, and behavior standards that exist in that public to which the program is directed. Luckily, much literature reporting previous work is available on many different groups describing these things rather well.

Research on Effecting Change

The discussion so far should not have given the impression that we are interested only in research that has dealt with the whys of human behavior and not in investigations of ways and means by which human behavior can be changed. Fortunately, through understanding of the whys, we can suggest ways of overcoming some of the barriers that we may encounter in our programs, and we can find ways to utilize existing positive forces for our own purposes. Earlier it was mentioned that much information is available on ways in which communication through the mass media can be improved to maximum effectiveness. Communication research has identified those media that are most likely to reach certain population groups. For example, we learn that during the past few years, there has been a shift in audiences: teenagers and very old people have become the primary radio audience, while children and adults have turned to TV.(23) There is evidence that TV is a very effective medium if the objective is to stimulate large numbers of people to take immediate action, but that to accomplish a more lasting change in behavior such media as newspapers and magazines tend to be more useful. In addition, of course, we have learned a great deal about specific techniques in the use of words, associations, images, color, and layouts. Many sociologists and psychologists alike have carried out extensive and intensive research on all the crucial aspects that contribute to effective communication through the mass media.(10, 11, 12, 18, 24, 33) Through it much is known today on each of the crucial elements of such communication process: "*Who* says *what* to *whom* for *what effect.*"

Another area in which research has yielded approaches and methods that can be most helpful in attempts to modify people's attitudes and behavior is that commonly known as "group dynamics." We have already referred to certain uniformities that exist within larger cultural boundaries. It has been well known for a long time that we also find certain common attitudes, beliefs, and behavior patterns among those belonging to the same smaller social groups. During the past decade, there has been great theoretical and research interest in this phenomenon. This has led

to identification of the conditions under which groups produce changes in behavior and, conversely, the conditions under which they serve as a source of resistance to changes attempted by outsiders. The classical examples are the studies carried out by Kurt Lewin and by some of his students on the effects that groups have on changes in food habits.(21, 22) A more recent illustration is provided by Betty Bond's report on a study in which effective use of groups resulted in a marked increase in the number of women who practice breast self examination for cancer.(1)

Earlier a research finding was mentioned to the effect that people tend to read advertisements and articles praising things they have already purchased. This minor illustration relates really to a major theory that has grown out of recent psychological research.(4) One of the findings of such research has been that immediately after people have made the decision to take a given action they tend to be very susceptible to any communication that will support the propriety or wisdom of the action. What is of particular interest to health education is the phenomenon that any beliefs or thoughts that were just barely strong enough to make the person decide to take that particular action becomes strengthened by such communication if it occurs at the time of or shortly after the action. One implication that can be drawn is that if we can get people just sufficiently motivated to take appropriate health action, we can greatly increase their subsequent motivation to take similar action and their acceptance of the principles involved by introducing an educational measure right at that time. For example, there may be no better time to strengthen motives and beliefs relating to obtaining a complete polio vaccination cycle than while people are getting their first vaccinations. However, this principle does not function when the action takes place under compulsion.

Application to Health Education

In looking back over the few research findings which have been barely touched on, it becomes clear that a most inadequate job was done in communicating the vast array of data and findings that are available to date. Fairly arbitrarily a small number of areas were selected and within each, with equal arbitrariness, one or two researches were picked for illustration.

A brief bibliography of articles and books pertinent to the foregoing discussion is appended to these pages. But even this bibliography represents a puny effort if one considers that any systematic search through the literature of any one of the behavioral sciences would yield within a few hours hundreds of separate research reports applicable to health education activities – that is, if the person doing so is familiar both with the available sources and with the terminology and jargon peculiar to

the behavioral sciences. This task would be difficult even for the expert; and for the outsider, it would be one which he could hardly hope to do justice.

A second factor contributes to this. Much research of potentially great usefulness for health education has been carried out and is reported in a context far removed from the health education context. To read the literature on such research and to recognize its possible implication is a challenge not easily met by either the pure scientist or the practitioner of health education. Yet there is available, strewn throughout hundreds of journals and books, an immense wealth of data, findings, and knowledge useful or potentially useful to the practitioners of health education.

To utilize this wealth to full measure, we need persons who are able to do three things:

1. Find, read, and understand the vast array of basic research literature in all the behavioral sciences;
2. Sense relevance of any of this to the problems and tasks of health education and of public health in general;
3. Translate basic theory and the findings from basic research into applied and action research in health education practice.

There is no doubt that applied social scientists in public health who meet the above qualifications should devote more time and energy to searching for and utilizing relevant data and knowledge gained in basic research in their dealings with the problems in public health programs. If greater support became available for such long-term activities in addition to support for social science activities focused more on the immediately pressing problems, the contributions of health education to the health and welfare of our nation could surely be extended far beyond today's achievements.

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GAPS AND POTENTIALS IN HEALTH EDUCATION RESEARCH

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It is all too easy to deplore the gap between theory and practice in public health education and thereby avoid taking effective action to reduce it. That such a gap exists is not to be denied, but it will be more helpful in the long run to try to analyze its reasons than to decry its existence.

To give us some perspective in this task it is first desirable to consider, if only briefly, a number of areas in which the gap is minimal. Behavioral science has provided a number of principles and findings which have long since been taken up by practitioners and are part and parcel of their armamentarium, so much so in fact that the contributions are no longer recognized as such — which is all to the good. Consider the area of motivation. It is today commonplace to accept the facts that all behavior is motivated, that motives distribute themselves in a hierarchy — some being more important than others, that much of the individual's behavior is determined by forces of which he is unaware, that behavior is determined not so much by *objective* factors in the environment as it is by the individual's *beliefs* about the environment which may or may not mirror reality.

Some of our basic principles of modern education based on behavioral science findings and theory are equally well integrated into health education practice. Consider the principle of participation by the learner in the educational process — the principle that learning takes place only in a motivated individual, the principles of retroactive inhibition and proactive inhibition, and the laws of memory. All these and many others, whatever language is used to describe them, are regarded as facts about people which health educators and other health practitioners uniformly accept without question.

Communication Research

However, it is not the focus today to consider areas in which behavioral science is being widely used in health education but rather to consider areas in which it is not. Rather than presenting a catalogue, I shall choose three examples. In the last 15 years a tremendous body of research literature has been developed on the communication process. We heard this morning, for example, that a great deal of information is available on how a variety of factors influence the success of a communication; we know a good deal about the influence upon communication of audi-

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ence factors, factors concerning the source of the communication and its credibility, factors involved in the use of various media of communication, and factors involved in the use of various channels of communication. It is little exaggeration to conclude that if all the major findings from communication studies were introduced into health education practice we would see profound changes in the patterns by which we attempt to inform and educate the public. For one thing, we would probably see a shift from what is at present too strong a reliance on the mass media of communication toward an approach which balances the present methods with more personalized approaches.

Motive and Perception Research

Another area in which behavioral science findings are going largely unused is in connection with some recent findings on motives and perceptions developed within the Public Health Service. Studies such as Hochbaum's on tuberculosis casefinding(1), a series by Rosenstock, Hochbaum, Leventhal, et al, on the impact of Asian influenza(2), another by Goding on responses to an offer of free screening for cervical cancer(3), and an on-going study by Kegeles* on reasons for acceptance or non-acceptance of pre-paid dental care are all defining and confirming the importance of several psychological variables in determining the response of individuals and groups to health appeals. They are showing that prominent among these variables are the individual's beliefs about his own susceptibility to the health problem in question, his beliefs about the severity of that problem, and his beliefs about the probability and efficacy of preventive or control measures. Such findings, if confirmed, have tremendous implication for health education practice in that they permit us to define the specific nature of the educational needs in any individuals or groups.

Group Dynamics Research

Finally, I should like to mention just one other area already discussed by Dr. Hochbaum in which considerable work over the last ten years or so has brought us to the verge of greatly improved educational methodology. I refer, of course, to the area of group dynamics. We are close to having in our hands a most effective tool for using the social forces existing within and between members of a group to influence the opinions of the group members. Indeed, accomplishing this in the laboratory is more than a possibility; it is a reality and has so been demonstrated countless times. It is obvious what the widespread adoption of such findings would mean for health education practice.

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* It is anticipated that a preliminary report by Kegeles will be available by Autumn, 1960.

Why are such findings not in general use? What is needed to translate a theory or a laboratory finding into a practical tool? If we follow Dr. Derryberry's distinctions between diagnosis and treatment, it appears that at least two requirements have to be satisfied. First, it is necessary to develop relatively simple and economical means to diagnose a problem in a reliable and valid way and, second, it is necessary to develop relatively simple and economical means of treating the diagnosed problems effectively. I have not applied these remarks specifically to health education because I do not think they are unique to health education; rather they apply to any practice and its related basic science. Now, to what extent are pure or basic scientists oriented toward developing simple, economical, reliable, and valid diagnostic and therapeutic techniques?

I should like to make the point that the pure scientist as a rule does not define problems in ways that have practical implications and that he is not concerned to develop simple and economical means to diagnose or to treat. Let us see why this is so. One of the central characteristics of basic research is that its proponents are more interested in truth and logic than they are in practical consequences. Einstein, Newton, Galileo, Pythagoras were not in the slightest concerned with developing a better mousetrap or, indeed with developing a mousetrap at all. They were interested in system, order, law, and truth. This characteristic of the basic scientist is a valuable one in the long run for his mind is free to wander according to the limits of his intelligence and intellect. But its contributions are usually not immediately practical. We all know how much energy, time, manpower, and money had to be brought together before $E = MC^2$ could become a weapon.

What is true for mathematics and physics is equally applicable in the area of behavioral science. For example, Sigmund Freud *as scientist* was not in the slightest concerned with developing simple means by which the practicing physician could study or even identify such forces as unconscious motivation, repression, libido. His orientation and the orientation of other behavioral scientists was and is more toward depth of understanding than toward simplicity and economy of methods. Accordingly, they have frequently used complex projective techniques or indirect questions or detailed observation or free association. Since their orientation was to study the relationships among behavioral factors, the question of developing simple, inexpensive techniques for measurement was not a primary concern. But the practitioner who draws from a science is not in the same situation at all. His concern is not merely with theory but with the application of theory. He is not trained to use projective tests, depth interviews, free association and the like. In his activities, in

fact, such methods even if successfully learned would frequently not be feasible because of the great time and expense involved in administering them.

Applied Research for Diagnosis Needed

What any practitioner needs is a relatively simple means for identifying the existence of variables which laboratory research has found to be important; and to a considerable extent behavioral scientists have *not* provided this sort of simple, economical test to measure important educational factors. Let me give you an example. Hochbaum has shown that a person's decision to participate in a TB casefinding program is partly determined by his beliefs about his susceptibility to tuberculosis. Those of you who know this research do not need to be told that simple-sounding though this variable of perceived susceptibility may be, it was extremely difficult to identify and measure. In fact, Hochbaum considered the relationship of the responses to several direct and projective questions as a basis for judging the nature of the individual's beliefs. His analyses of the responses were complex and quite time consuming.

In normal circumstances, it would not be possible for health educators to go to the trouble to make this determination in their daily practices. Indeed, most health educators are not and should not be trained to use the complex methods involved. Yet, the fact remains that in diagnosing an educational problem they need to know about people's beliefs concerning their susceptibility to illness. And no simple measures of perceived susceptibility now exist.

Applied Research for Method Needed

It is thus important to recognize that theoretical findings cannot be applied in the field setting until simple methods are found that make it feasible. However, even after the need for such simple methods has been recognized, it may still be many years before anything practical develops. Consider the process by which a vaccine for polio was developed. For it was in the 17th century that Leeuwenhoek first saw bacteria, but it was not until the 18th century that it was demonstrated that these little organisms could cause serious disease. It was not until the 20th century that we were able to identify three specific viruses that caused poliomyelitis. It may be pointed out in passing that even with this knowledge, the certain diagnosis of polio, while a potential possibility, did not and has not yet become a widespread practical reality since most practitioners do not have the means readily at hand to diagnose polio. But to continue with a consideration of the develpoment of a preventive, clearly it was not possible to develop a vaccine to prevent polio before one was able to grow the virus in the laboratory and the accomplishment of this task required a tremendous exercise of

ingenuity as well as heavy financial support. And, finally, after a laboratory vaccine was developed the job was still not finished. One had then to translate this vaccine that had been produced as it were by hand into a product that could be produced commercially on a large scale which would have high potency and low risk. Thus, although we knew the specific causes of paralytic polio by 1939, we did not have an effective and widely available vaccine to prevent it until almost 1956.

While the time needed to bridge the gap between the laboratory and the field will vary considerably depending upon the levels of support available and upon the complexity of the technical problems that need to be solved, the process is essentially the same in all fields. Thus, after basic research has identified variables and principles, we need applied research to show how these principles operate in our specific field setting, and we need research to develop simple and economical methods for diagnosing and treating problems. The principal gap between theory and practice in health education is due to the failure in the past to support such applied methodological research.

Whose responsibility is it to support applied research designed to develop simple techniques for measuring and treating? It seems obvious that the responsibility belongs to those who need and stand to profit from the information – namely the practitioners themselves.

I have indicated that because the pure scientist is not primarily interested in practical matters, he generally does not perform applied methodological research. Another aspect of the theoretical orientation of the pure scientist is that he strives primarily to *understand* behavior and only secondly to *change* behavior. Accordingly, we see historically a much greater emphasis in behavioral science on explaining why people do what they do than on attempts to influence what people do. Even our burgeoning post-war research on group dynamics and communication, which does focus on effecting behavioral and attitudinal change, is more concerned with the nature of the forces that produce change than with the ends that may be served by such change. Consequently, we find communication researchers and group dynamics researchers working in laboratory settings that are frequently artificial because they attempt to change attitudes of students who have relatively little at stake in maintaining their original attitudes. There are very few experiments indeed in which the attempt is made to influence adults in their natural social groupings to change attitudes or behaviors that are important to them. Thus, another research gap in the health education area is for research on educational methodology conducted in life-like field settings.

Because of the forcefulness with which I tried to make the point of the distinction between basic science and application, I may inadvertently have left the impression that we know all we need to know

about why people do what they do. Of course, this is not true. We do know much that is potentially applicable but if there is one truth we have learned, it is that human beings are wondrously complex. The more we learn about them the more do questions appear that need answers. While we know much about the behavioral determinants of the adult's decision to take or not to take certain health action, we know next to nothing about how those determinants arose. Herein lies the gap. We suspect from our knowledge of the socialization process that much had to come from the parents. But how? How do parents teach their children to believe that they are or are not susceptible to certain diseases or that certain diseases can be prevented, or that it is a sign of strength or of weakness to avoid doctors as long as possible? What is the role of the school in teaching such beliefs? Can the school successfully compete with parents in such instruction? How do one's personal experiences reinforce or undermine one's established beliefs? Are different kinds of people differently susceptible to education? We know, for example, that you can teach an old dog new tricks, but how difficult is it and does it matter what kind of tricks you are trying to teach the dog?

More Evaluation Needed

Finally, I should like to comment briefly on evaluation studies. Certain techniques for evaluating the effectiveness of materials and programs are available and have been available for some time. Yet, it would appear that program evaluation is not the rule in health education. The practitioner's ability to improve his own efforts is contingent upon his ability to profit from experience. In the area of clinical medicine the outcome of a particular diagnosis or treatment, while complex enough to determine, is far more self evident than the outcome in public health education. It thus becomes crucial in health education to use objective, scientific methods for assessing how well we are doing as prerequisite for installing program changes. Certainly the failure to evaluate more widely is a gap that needs to be and can readily be filled.

Summary

I should like to summarize the major points that I have covered.

A. Because of the orientation of the basic scientist to theory, applied research is needed in two areas:

FIRST, applied research is needed to develop simple, economical, and valid methods for diagnosing health education problems;

SECOND, applied research is needed to develop valid methods for educating individuals and groups in a real life health setting.

B. In addition to applied research, continuing basic research is needed to increase our growing knowledge of why people do what they do.

C. Finally, systematic program evaluation as an aid to program improvement should be incorporated and undertaken on a much broader scale than is currently being done in public health.

The needs for the research program I have outlined have been widely recognized, for example, in the technical discussions of the 12th World Health Assembly on "Health Education of the Public." In the background document for this Assembly explicit needs were cited for studies of the level of health knowledge, attitudes, and practices of selected population groups, basic studies of health behavior change, and studies connected with methods and materials of health education.

The potentials of the research program I have outlined are very great. But they will not be realized unless you, the practitioners, provide the required levels of support without which research programs simply cannot operate. For my part, I believe that such support will be provided because it must be provided. The old saw that necessity is the mother of invention was never more true than it is today in the field of public health. As it has become necessary to develop better means of influencing the public to take voluntary actions of a long-range and continuing nature to protect their health, science has developed and is today developing the basic materials to explain what the requirements are for such education. If we can continue the support of such basic research as well as the various applied researches and program evaluation that I have discussed, I have no doubt that we shall be able to bring personal preventive health practices to a higher level than has ever before been possible.

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